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Measuring and Improving Functional Outcomes after Robot-Assisted Radical Prostatectomy

Learning Objective: At the conclusion of this continuing medical education activity, the participant will be able to cite the rates of incontinence and erectile dysfunction following robot-assisted radical prostatectomy, identify the patient and surgeon-driven factors impacting these functional outcomes and describe the developments in surgeon education that can help improve these outcomes in the future.

This AUA Update aligns with the American Board of Urology Module on Oncology, Urinary Diversion and Adrenal. Additional information on this topic can be found in the AUA Core Curriculum section on Oncology - Prostate.

Marissa Maas, MD,[1] Nima Nassiri, MD[1] and Andrew J. Hung, MD[1]

[1]USC Institute of Urology, Keck School of Medicine, University of Southern California, Los Angeles, California

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CLINICAL EPIDEMIOLOGY OF ROBOTIC PROSTATECTOMY AND IMPACT ON PELVIC FUNCTIONS

Prostatectomy remains a mainstay of management for the appropriately selected patient with localized prostate cancer. Trends from the National Inpatient Sample database demonstrated a steady increase in robotic utilization since 2010, with increased utilization occurring firstly at academic centers of excellence, and then disseminating to lower volume and nonacademic medical centers. The rapid expansion of the robot-assisted radical prostatectomy (RARP) has led to a marked redistribution of technical approach, reducing open and laparoscopic prostatectomy utilization rates by up to 70% and 90%, respectively.[1] As the surgical approach has evolved, key functional outcomes have also evolved: 12-month continence recovery is better after RARP compared to open retropubic radical prostatectomy (RRP; OR 1.53, p=0.03) or laparoscopic radical prostatectomy (OR 2.39, p=0.006).[2] The 12-month erectile function (EF) rates are also much higher with the robotic approach compared to RRP (OR 2.84, p=0.002). Of note, studies comparing open and robotic approaches remain limited by the lack of randomization, and long-term side effects of prostatectomy remain centered around urinary and sexual function.

URINARY INCONTINENCE AFTER RARP

Definition. There is presently no standardized definition for post-prostatectomy urinary continence recovery, and this variability in definition limits cross-study comparisons. Some studies define continence recovery as achieving a strictly pad-free lifestyle with almost no unintended micturition events, while others allow the use of a "safety pad." Incontinence has also been measured in number of pad changes, number of incontinence episodes, weight of pads and self-reported quality of life measurements on validated questionnaires. Additionally, climacturia, or urinary incontinence following ejaculation, is a specific form of incontinence observed in prostatectomy patients. **Rather than measuring pad weight, the 2019 AUA/SUFU (Society of Urodynamics, Female Pelvic Medicine, and Urogenital Reconstruction) guidelines recommend assessing for urinary incontinence based on history and physical examination, including urodynamic testing (fig. 1).**[3]

Incidence of incontinence after RARP. **Persistent incontinence beyond 12 months after radical prostatectomy ranges from 8%–11%, with a 9% mean value.**[2] In a 5-year, retrospective, single institution study, no-pad continence was observed in 74% of patients, and 91% of the remaining patients required only a safety pad.[4] In a trial comparing complications following open prostatectomy and RARP, 19% of patients reported a need to wear at least 1 daily pad, and 52% reported at least 1 leakage event daily at 1 year of followup.[5] Data from the ProtecT trial demonstrated that compared to active surveillance, there is a higher rate of incontinence after RARP (55% at 6 months),[6] defined as using more than 1 pad per day. Additionally, climacturia is reported in around a third of prostatectomy patients.[3]

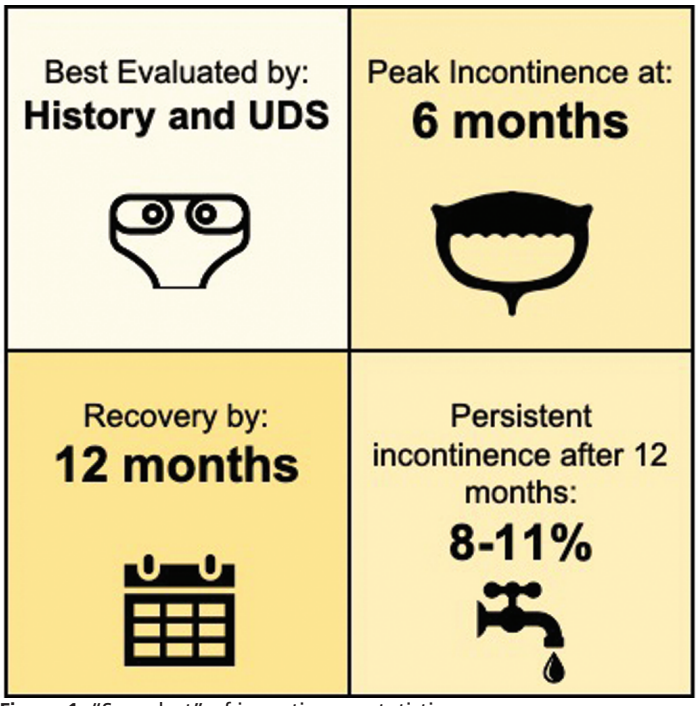

Figure 1. "Snapshot" of incontinence statistics.

Time to continence recovery. **Peak incontinence rates after radical prostatectomy occur by 6 months, with recovery of continence generally occurring within 12 months after surgery (fig. 2).**[6] Patients should not expect immediate return to continence after RARP. However, the longer patients go without successful return to continence, the less likely they are to ever achieve continence in the future. At the 1-month postoperative time point, 75% of incontinent patients will eventually recover continence, with this probability decreasing to 58% of incontinent patients at the 6-month point, 41% at 12 months and 15% at 18 months.[7] **Similarly, earlier return to continence and current postoperative functional status are significant predictors of future continence.**[7,8] Severity of incontinence, defined by pads per day requirement, inversely relates to the chance of future continence recovery.[8]

Impact of anatomy on continence recovery. A multitude of anatomical factors have been presented as contributors to continence return. Multiple studies demonstrated a relationship between membranous urethra length and return to continence. A preoperative membranous urethra length >12 mm was significantly associated with safety pad continence at 3, 6 and 12-month followup on both univariate and multivariate analysis.[9] In a

ABBREVIATIONS: automated performance metric (APM), body mass index (BMI), erectile dysfunction (ED), erectile function (EF), International Consultation on Incontinence Urinary Incontinence Short Form (ICIQ-UI-SF), International Index of Erectile Function (IIEF-5), pelvic floor physical therapy (PFPT), robot-assisted radical prostatectomy (RARP), retropubic radical prostatectomy (RRP), radiation therapy (RT), Sexual Health Inventory for Men (SHIM)

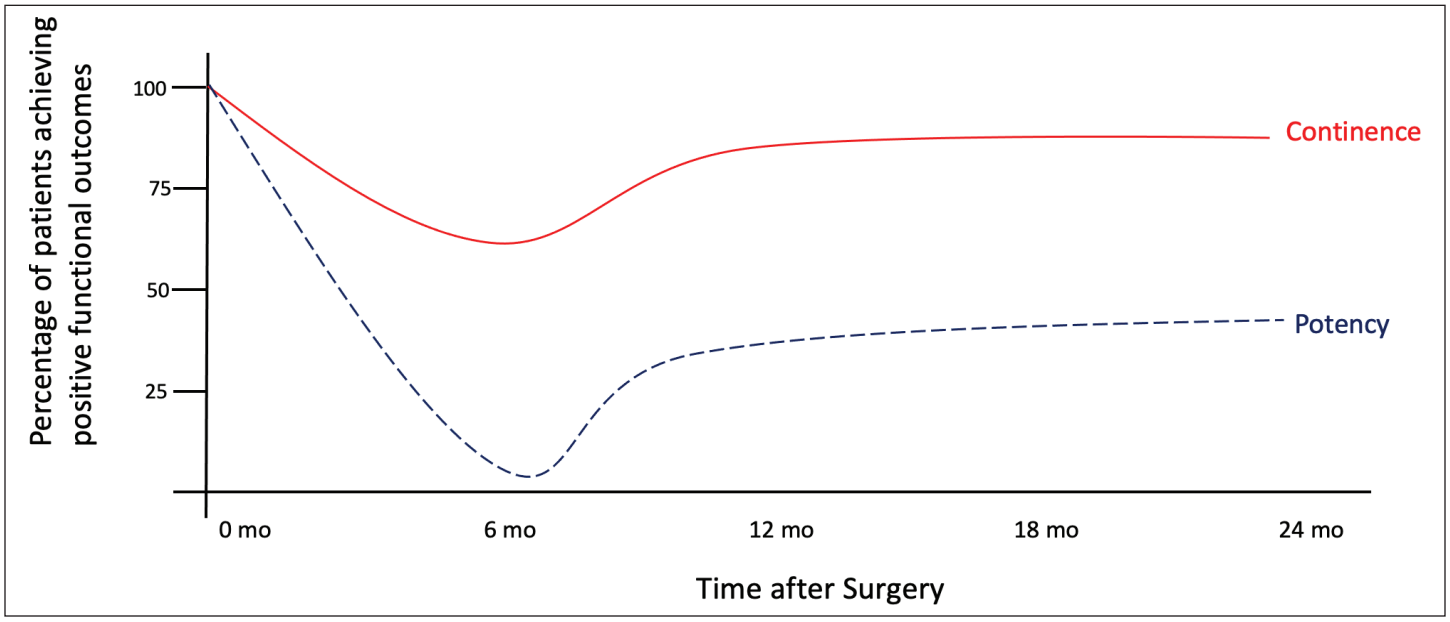

Figure 2. Percentage of patients achieving continence and EF at different postoperative time points.

cohort of 602 patients, membranous urethral length correlated positively with post-RARP continence rates.[10]

Postoperative bladder shape, measured by the ratio of longitudinal and horizontal length on cystography, was also significantly associated with immediate return to continence on univariate and multivariate analysis, but does not play a role in patients achieving continence after 6 months.[11] Narrow vesical angle, defined as the angle of the bladder neck relative to the pelvic inlet <100°, was also significantly predictive of incontinence on univariate and multivariate analysis at immediate, 1-month and 1-year followup. Postoperative bladder shape and vesical angle can be optimized by minimizing anastomotic tension, including fully detaching the bladder from the peritoneum.

Surgeon and intraoperative factors. **More experienced surgeons produce better continence rates.** The LAPPRO trial found significant differences in functional outcomes, including continence rates, based on surgeon heterogeneity. Approximately 40% of difference in functional outcomes could be explained by annual surgical volume.[5] A retrospective review and scoring of surgeon performance using the global evaluative assessment of robotic skill metric correlated significantly to 3-month continence rates of RARP patients.[12]

Two major surgical techniques improve continence rates: a nerve-sparing approach and a Retzius-sparing approach. Nerve-sparing RARPs result in superior continence rates versus nonnerve-sparing procedures, with greater degree of nerve sparing producing better functional results. In a prospective cohort of 529 patients, final continence rates were significantly higher in patients who received bilateral nerve-sparing RARPs as opposed to those who received unilateral nerve sparing or no nerve sparing.[13] Another study found that while a nerve-sparing technique was significantly associated with early return to continence, long-term recovery of continence rates were unaffected.[11] The current studies on nerve sparing are limited by their observational nature; in the future, randomized trials may help elucidate the effect of surgical technique versus the favorable tumor conditions that made nerve sparing possible.

With regard to a Retzius-sparing approach, 1 group reported 51% of patients achieved immediate no-pad continence following catheter removal after Retzius-sparing RARP, compared to 21% of patients who received a trans-Retzius RARP.[14] The Retzius-sparing group demonstrated a median time to continence of 1 day, compared to 21 days in the trans-Retzius cohort. The difference in continence rates persisted over time: 91% of patients in the Retzius-sparing group and 64% of the trans-Retzius group reported no-pad continence at 6 months.[14] These findings were also reproduced in a prospective study in which a Retzius-sparing technique led to significantly earlier return to continence.[15]

An intrafascial nerve-sparing approach, thought to preserve the nerve fibers surrounding the prostate, contributes to higher continence rates at 3 months post-RARP (RR 1.14, p=0.006).[16] Combined anterior and posterior musculofascial reconstruction is also associated with a significant urinary continence advantage 3 months after RARP (OR 0.76, p=0.04).[2] Besides nerve-sparing and fascial reconstruction, other intraoperative modifications to RARP may help achieve future continence, including a puboprostatic ligament sparing approach, preservation of urethral length, bladder neck preservation and seminal vesicle preservation.

Finally, several studies reported a relationship between blood loss and functional return. Blood loss of <400 ml during RARP was a significant independent predictor for immediate continence recovery.[17] Higher blood loss correlated with lower levels of safety pad continence rates at 3 and 12 months as well, although this relationship did not achieve statistical significance. It is unclear from this study whether blood loss is a reflection of surgeon (in)experience or patient-specific pathology; however, functional outcomes may be directly affected by blood loss as regional intraoperative ischemia may affect the viability of tissues involved in continence.

Pelvic floor physical therapy (PFPT). PFPT is designed to strengthen and engage the muscles supporting the external urethral sphincter. **Patients can strengthen these muscles**

under the direction of a physical therapist or as a self-directed exercise, and it can be initiated before or after surgery, with some evidence suggesting PFPT can improve continence recovery.[18] In a cohort of patients who began PFPT prior to surgery and then continued in the post-operative period, a significant improvement in continence was achieved over the 11-week followup period.[18] The mean time to no-pad continence recovery in this cohort was 10.5 weeks, achieved in 38% of men.

Predicting continence recovery. Using a combination of preoperative factors and intraoperative characteristics, several groups have developed nomograms to predict continence return following RARP. **Consistent themes include younger age and better baseline functional status contributing to better postoperative outcomes.** In an analysis of over 9,000 patients, Tutolo and colleagues found that a high European Association of Urology prostate cancer risk classification, history of radiation therapy (RT), low preoperative functional status and a higher score on the International Consultation on Incontinence Urinary Incontinence Short Form (ICIQ-UI-SF) were preoperative factors significantly associated with higher rates of incontinence at 12 months after surgery.[19] At the earlier 3-month time point, older age, higher preoperative ICIQ-UI-SF score, lower 3-month functional score and higher 3-month ICIQ-UI-SF score were all significantly associated with poorer rates of continence recovery.[19] In another cohort of 180 patients, age was a significant independent predictor of incontinence at 1, 6, 12 and 24 months on univariate analysis, with age remaining a significant predictor on multivariable analysis at all followup points.[20]

The data on the impact of body mass index (BMI) are nonconclusive. While some studies found that BMI does not appear to have an impact on postoperative continence return, in a study focusing on 478 patients, older age, higher BMI and lower preoperative continence status were predictive of worse continence outcomes.[21]

Salvage RT and salvage RARP. There are limited data on the effect of salvage RT on continence after RARP, but in a cohort of 70 patients receiving salvage external beam radiotherapy after RARP, there were no significant additional impacts on long-term continence.[22] In the setting of salvage RARP following RT, patients suffer worse continence outcomes. In a literature review of patients undergoing salvage RARP after any kind of RT, only 60% of patients achieved continence recovery.[23] Continence rates after salvage RARP appear to be negatively impacted by the greater degree of tissue irradiated/ablated. Additionally, both adjuvant and salvage radiation can complicate the incontinence picture by exacerbating overactive bladder symptoms on top of worsening stress urinary incontinence, as well as limiting surgical incontinence treatment options.[3]

ERECTILE DYSFUNCTION (ED) AFTER RARP

Definition. The AUA defines ED broadly as the "inability to attain and/or maintain penile erection sufficient for satisfactory sexual performance."[24] Due to the subjectivity of this assessment, multiple validated questionnaires have sought to standardize the definition of ED. The most widely used of these are the Sexual Health Inventory for Men (SHIM) questionnaire and the International Index of Erectile Function (IIEF-5) questionnaire.

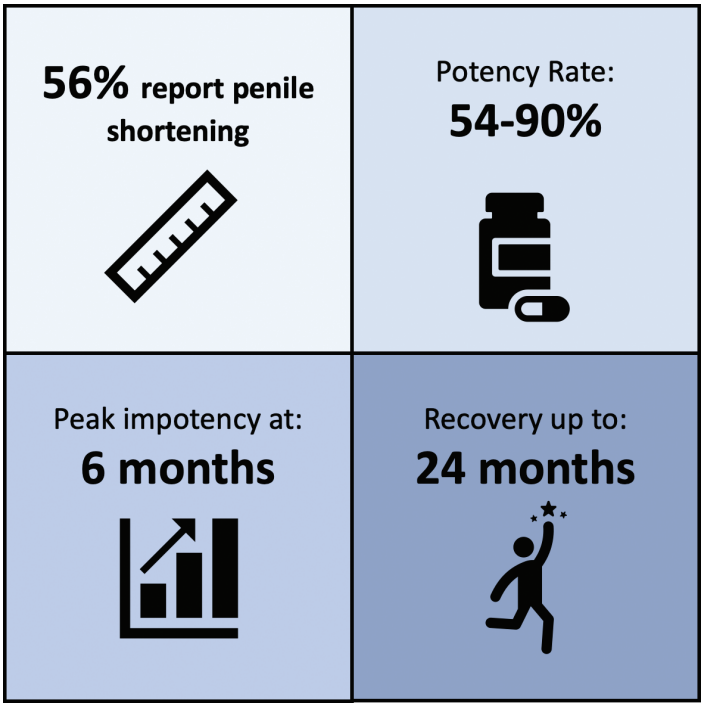

Figure 3. "Snapshot" of ED statistics.

Nevertheless, the definition of ED is not standardized throughout the urological literature. A recent systematic review and meta-analysis found that 7 common instruments with 23 different cutoffs were used to evaluate ED among 103 papers.[25] In some studies included in this meta-analysis, ability to achieve sufficient erections with the assistance of oral medications was defined as having EF. Physicians need to be aware of the range of variable definitions used for ED when presenting functional data to patients.

Patients should be counseled that in addition to postoperative changes in their ability to achieve and maintain an erection, a decrease in penile length may be temporarily or permanently experienced. This phenomenon is likely due to manipulation and internalization of the membranous urethra. Stretched penile length is significantly lower at 10 days post-prostatectomy compared to preoperative measurements, but recovers somewhat up to 1 year.[26] Overall, 56% of patients self-reported penile shortening and 23% reported penile morphometric deformation after radical prostatectomy (fig. 3).[27] Compared to RRP, RARP was associated with lower rates of perceived deformation.[27]

Incidence. Reported EF rates after RARP range from 54%–90%.[28] This wide variability is likely affected by the lack of standardization of ED definitions. **Nonetheless, prostatectomy clearly has a major, negative impact on EF.** Data from the ProtecT trial demonstrated that compared to patients on active surveillance, there is a higher rate of sexual dysfunction reported in the surgery group (95% 6 months after RARP).[6] Of patients in the active surveillance group, 68% had erections firm enough for intercourse at baseline, which decreased to 59% after 6 months on active surveillance. This is compared to 5.1% of patients who reported sufficient erections after surgery (from a baseline of 66%) and 18% of patients after RT (from a baseline of 63%).

While prostatectomy of any approach reduces EF, there is evidence to suggest that RARP results in superior rates versus RRP or laparoscopic radical prostatectomy. In a review comparing functional outcomes after prostatectomy, the overall EF rates (as defined by erection sufficient for intercourse) were reported to range from 31%–70% for RARP patients.[29] In the included studies, RARP led to significantly lower rates of ED than pure laparoscopy (OR 2.58, p <0.001).[29] In the LAPPRO trial of over 4,000 patients, at 24-month followup 68% of RARP patients reported erections insufficient for penetration (compared to 74% of RRP patients), 85% scored <22 on the IIEF-5 (compared to 90% of RRP patients) and 75% scored <17 on the IIEF-5 (compared to 80% of RRP patients).[5]

Time to recovery. **Similar to incontinence, peak rates of ED occur within the first 6 postoperative months, with steady improvement in sexual recovery until the 24-month time point (fig. 2). Beyond 2 years, increased recovery of sexual function is marginal.**[6] In the ProtecT trial, only 15% of men reported EF 6 years after surgery, compared to 29% of men in the RT cohort and 35% of men in the active surveillance cohort. Self-reported EF rates started at 68% in the active surveillance cohort and steadily declined over the subsequent 6 years of followup.

In a cohort of 1,000 RARP patients, 6-month return to EF (defined as IIEF-5 ≥22 with or without phosphodiesterase 5 inhibitor use) rates were 46.5% immediately postoperatively.[7] However, the longer a patient went without return to EF, the lower the likelihood of ever regaining EF. Only 19.7% and 15.2% of patients achieved EF after 6 and 12 months, respectively, if they had not done so already.[7] Almost no patients recovered EF after 18 months.[7] **Taken together, this suggests that 6–12 months postoperatively is the peak time for EF to return, if it will eventually occur at all.** Patients with lasting functional deficits should be offered referral to an expert who can help manage these common and impactful cancer survivorship problems.

Surgeon and intraoperative factors. **When oncologically safe and surgically feasible, a nerve-sparing technique should be used in all patients who hope to achieve future EF.** A cautery-free technique minimizes thermal trauma to the nerves. In a systematic review, nerve-sparing approaches led to EF rates from 54.1%–96.6% at 1 year after RARP, although it is important to mention that preoperative patient factors, EF definition and surgical technique were not standardized in this group.[30] Along with nerve sparing, arterial sparing and athermal techniques are associated with better EF rates.[31] In addition to nerve sparing, fascial thickness and preservation are also associated with lower rates of ED,[32] which may be due to the ability of fascia to protect the nerves. An intrafascial dissection is associated with higher rates of EF at 6 months (RR 1.14, p=0.02) and 12 months (RR 1.38, p=0.005) when compared to nonintrafascial dissection, especially in men ≤65 years old.[16] Similar to continence, EF (defined as IIEF-5 ≥18) may be affected by intraoperative blood loss, as blood loss exceeding 400 ml was an independent negative predictor of EF at 1 year (OR 0.52, p=0.04).[17]

Nerve-sparing categories include: grade 1, total nerve sparing; grade 2, subtotal nerve sparing (preservation of most large neural trunks and ganglia); grade 3, limited nerve sparing (preservation of large, lateral neural trunks) and grade 4, no nerve sparing. A retrospective study comparing 1-year outcomes in grade 1 to 4 nerve sparing reported erection sufficient for intercourse in 91% of patients with grade 1, 81% with grade 2, 74% with grade 3 and 62% with grade 4 nerve sparing.[33] In this study, nerve advancement was attempted in select grade 4 patients, potentially limiting the reproducibility of the grading system. All of the patients included in this analysis had EF at baseline, and 82% of patients in group 1, 74% in group 2, 66% in group 3 and 55% in group 4 returned to SHIM score >21 after a year.[33]

Penile rehabilitation. While PFPT was designed to support continence return, penile rehabilitation programs focus on increasing blood flow to the penis after prostatectomy to promote healing of damaged nerves and prevent ischemia and resultant fibrosis. Penile rehabilitation can be performed successfully with phosphodiesterase inhibitors, vacuum pump erectile devices, intraurethral alprostadil or low intensity extracorporeal shock wave therapy. One study demonstrated that patients who took daily tadalafil for 2 years after RARP had higher rates of EF at 2-year followup than did patients who did not take tadalafil.[34] Alternatively, patients who received low intensity extracorporeal shock wave therapy prior to catheter removal had higher sexual function scores on the Expanded Prostate Cancer Index Composite metric.[35] There was a significant difference in scores between patients who received the therapy and those who did not at 6, 9 and 12 months.[35]

Preoperative treatment with vasodilators may also be beneficial. A cohort of 106 men were prescribed tadalafil and L-citrulline 2 weeks prior to surgery and were assigned to vacuum erective device therapy 1 month postoperatively, both of which were continued for a year.[36] Of these patients, 56% achieved EF after a year, compared to 24% of patients off the rehabilitation protocol.

Predicting EF recovery. **Similar to continence, patient age, baseline EF and comorbidity index are the most relevant preoperative predictors of EF recovery.**[28] In addition to age, degree of nerve preservation, prostate size and grade are predictive of future EF as well.

The impact of BMI on resultant EF is controversial. One study showed both higher BMI and older age were associated with lower EF rates.[37] Another proposed that 2-year EF can be predicted based on age, BMI, prostate cancer stage, nerve-sparing technique and preoperative self-reporting of erection fullness.[38] However, other studies have found that there were no significant differences in SHIM scores 3 months post-RARP across BMI categories.[39]

Salvage RARP. As with continence, salvage RARP produces worse EF recovery rates than primary RARP. In a cohort of 96 patients who received RT, 55% reported EF (SHIM score >21, with or without oral medications) after salvage RARP.[40] Salvage RARP worsens EF further for patients who already have reduced EF following primary RT. This can be explained in part by the increased friability of irradiated tissue and the increased difficulty of nerve dissection. When possible, efficacious nerve sparing in salvage RARP increases EF rates compared to no nerve sparing (26% versus 4%).[41]

STRATEGIES FOR MEASURING PATIENT-REPORTED OUTCOMES

While validated questionnaires are helpful for standardizing patient experience, all quality-of-life outcome measures are at risk for response shift. This phenomenon–in which patients report that their quality of life has improved over time not because their problem has actually improved, but because they have adjusted to living with it–has been demonstrated specifically in perceived functional outcomes following prostatectomy.[42] Additionally, patients may feel compelled to "please" their provider by reporting better outcomes, introducing bias into the results. **One possible solution is hiring an independent research coordinator who is dedicated to following up with patients, as opposed to patients completing self-assessments.** An independent research coordinator may, to some effect, help mitigate some of the bias, especially if they assure the patient that their responses will be anonymized to their physician (table 1). A dedicated coordinator would ideally also have the time and resources to routinely follow patients who are difficult to reach, reducing the number of patients lost to followup.

An additional option for addressing poor patient compliance with post-treatment questionnaires includes automated reminders. **Automated email questionnaires assessing continence after prostatectomy may provide increased response rates and faster responses than mailed paper questionnaires without compromising accuracy.** MUSIC (Michigan Urological Surgery Improvement Collaborative) utilized a standardized questionnaire and signed up all patients undergoing radical prostatectomy to receive either an automated email or a paper mail questionnaire preoperatively and postoperatively at 3 and 6 months, which were added to a multicenter database registry.[43] Of the patients, 88% completed the preoperative questionnaire, and 84% and 90% responded to the 3 and 6-month questionnaires, respectively, with the majority of patients utilizing the web-based survey.[43] This standardized tool allowed for the collection and aggregation of multicenter data, increasing the availability and comparability of patient-reported outcomes after prostatectomy.

Table 1. Strategies for measuring patient-reported outcomes

- Independent research coordinator
- Automated survey reminders
- Web-based survey platforms

STRATEGIES FOR IMPROVING PATIENT OUTCOMES

Surgeon learning curves. Outcomes-based learning curves for RARP are well documented in the literature. In 2010, prior to major dissemination of robotic surgery at both teaching and academic hospitals, robotic surgery was twice as likely to lead to an adverse event vs open surgery (OR 2, 95% CI 1.4–5.3).[44] This indicates an initial learning curve period during which patient outcomes may suffer as surgeons learn new technologies (in this case the RARP; table 2). In 1 study, performing over 100 RARPs correlated to improved functional outcomes, while a separate study estimated the initial learning curve to be around 25 procedures, evaluated by total procedure time and patient length of stay.[45] **In general, surgeon volume reflects experience and comfort level with the procedure, and more experienced surgeons produce better functional outcomes.**

Table 2. Strategies for improving patient outcomes

- Increasing surgeon experience and case volume
- Video review and performance feedback
- APMs: derived from instrument kinematics and events data from the robot
- Simulation training reduces the learning curve

Performance feedback. Targeted surgeon performance feedback moves beyond sheer repetition of procedure; it allows for insight into where one stands and, ideally, opportunity to improve and shorten a surgeon's learning curve. **Video review with manual assessment of technical skills is considered a gold standard for providing surgeon feedback. However, it is resource-intensive.** Video review of RARP surgeon performance, judged using the Global Evaluative Assessment of Robotic Skills and the Generic Error Rating Tool, correlates with future patient continence rates.[12] Several studies have correlated retrospective video assessment of intraoperative steps with reduced likelihood of future complications, although video review still has significant limitations such as interobserver variability.[46] In order to combat the resource burden of expert video review, a study by MUSIC demonstrated that crowd-sourced evaluators rated surgeon skill similarly to expert peer reviewers.[47]

Another area of interest in surgical education is automated performance metrics (APMs). **Derived from instrument kinematics and events data from the robot, APMs can differentiate expert and training surgeons during the RARP.**[48] As largely measures of surgeon efficiency, APMs do not correlate well with technical skills evaluations, suggesting that they are measuring different aspects of surgeon performance.[48] Deep learning models incorporating both intraoperative APMs and clinical data were able to predict 3 and 6-month continence rates.[49] Future iterations of APMs may focus more on automating technical skills evaluation than mere evaluations of surgeon efficiency, providing surgeons with more actionable feedback.

Simulation training. As surgical training evolves to incorporate the use of simulation, the old adage of "see one, do one, teach one" should perhaps be replaced with "see many, simulate many, do many, teach one." **Simulation is a useful adjunct to practice, and while simulation and dedicated curriculum can help shorten the learning curve, they are limited by cost and availability**. Reducing the learning curve will help surgeons achieve better functional results earlier in their practice. In 1 study, simulated robotic skills training outperformed traditional live laparoscopic training in reducing the learning curve.[50] There are exciting innovations on the horizon in the world of simulation, including incorporation of procedure-specific and even patient-specific simulation. In the future, we will likely see simulation continuing to assume a more prominent role in surgeon education.

CONCLUSIONS

Patients should be informed that their continence and EF will likely suffer after RARP, especially immediately postoperatively. Optimal return to function, be it continence or EF, occurs around 6–12 months. Recovery varies dramatically based on preoperative and intraoperative factors as well as postoperative care, including PFPT and penile rehabilitation. Maximal nerve-sparing as well as bilateral nerve-sparing procedures contribute to better functional outcomes, and the Retzius-sparing approach may help as well. Patients should optimize their preoperative health status to maximize postoperative recovery. A number of tools have been developed for measuring patient outcomes and improving surgeon education. As surgeon volume and experience appear to contribute directly to postoperative outcomes, surgeons of all experience levels should avail themselves of continued education. New technologies in surgical education, including video review and APMs, can further improve individual technique and patient outcomes.

DID YOU KNOW?

- Incontinence rates are worst 6 months following RARP, with return of "safety pad" continence occurring by 12 months postoperatively in 80%–90% of patients.
- Estimates of ED after RARP range from 54%–90%, with EF rates also at their nadir at 6 months and improving from 6–12 months postoperatively.
- Patient demographics affect functional outcomes; notably, younger, healthier patients with higher baseline functional status achieve better long-term results for both EF and continence.
- Surgeon experience and nerve-sparing approaches contribute to superior continence and EF outcomes. Additionally, Retzius-sparing approaches and PFPT improve continence outcomes, while penile rehabilitation improves EF outcomes.
- Surgeon education, including video review and feedback, APMs and virtual training platforms, has the potential to improve functional outcomes.

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Study Questions Volume 41 Lesson 2

1. In the ProtecT trial the rates of incontinence at 6 months post-RARP were
   a. 15%
   b. 35%
   c. 55%
   d. 75%

2. Patients undergoing radical prostatectomy should participate in pelvic floor physical therapy
   a. preoperatively
   b. postoperatively
   c. both pre- and postoperatively
   d. not at all as there is no benefit

3. The patient most likely to achieve the best EF outcomes after RARP is
   a. a 45-year-old man with a preoperative SHIM of 25 and a grade 4 nerve-sparing approach
   b. a 60-year-old man with clinical T3 prostate cancer undergoing salvage RARP after RT
   c. an 85-year-old man with a preoperative SHIM of 8 and a grade 1 nerve-sparing approach
   d. a 55-year-old man with a BMI of 28 and preoperative SHIM of 23 undergoing a grade 1 nerve-sparing approach

4. The surgeon most likely to achieve better functional outcomes in his/her patient is the surgeon who
   a. is closest to his/her formal training
   b. has performed maximum simulation training
   c. has performed >100 RARP cases without regular performance feedback
   d. has performed >100 RARP cases and receives regular video review feedback

5. To evaluate surgeon performance, automated performance metrics (APMs) use
   a. efficiency
   b. technical skill
   c. clinical outcomes
   d. intraoperative errors